National Weather Service
Storm Data and Unusual Weather Phenomena

August 2005

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm

IOWA, Central

Bremer County

4 ENE Readlyn **04** **0029CST** **0** **0** **5K** **5K** **Thunderstorm Wind (MG55)**

A cold front approached the area from the northwest and was located over northwest Iowa during the late afternoon. The airmass was very unstable, however it was also very capped with 700 mb temperatures around +15 C. Temperatures rose into the mid 90s with dew point readings in the low 70s south of the front. The lifted index was around -10 C with CAPE values in the 4500 to 5000 J/kg range. In spite of this, a cape of nearly 300 J/kg remained in place. Hail was limited by the fact that the freezing level was at 16,200 feet. A line of intense thunderstorms developed to the northwest of the CWA, behind the cold front. The storms progressed southeast into the area but weakened rapidly as the moved into the highly capped and weakly sheared airmass over Iowa. There were reports of small hail and winds of 40 MPH with many of the storms. One storm moved through Bremer County and produced a 63 MPH winds east of Readlyn.

Emmet County

Estherville **09** **1525CST** **0** **0** **2K** **5K** **Hail(0.88)**

Emmet County

4 W Wallingford **09** **1538CST** **0** **0** **3K** **5K** **Hail(1.00)**

Palo Alto County

1 W Graettinger **09** **1551CST** **0** **0** **3K** **5K** **Hail(1.00)**

Emmet County

Armstrong **09** **1600CST** **0** **0** **10K** **Thunderstorm Wind (EG61)**

Pocahontas County

Laurens **09** **1627CST** **0** **0** **2K** **Thunderstorm Wind (EG52)**

Palo Alto County

Mallard **09** **1638CST** **0** **0** **3K** **Thunderstorm Wind (EG52)**

A hot and unstable airmass was in place in Iowa ahead of an approaching cold front. High temperatures reached the mid to upper 90s with dew point readings around 70. By the late afternoon, heading had pushed the lifted indices to the -7 to -8 C. range with CAPE values around 3600 J/kg. The cold front made slow progress southeast into the state. Thunderstorms erupted along the front and produced a small area of high winds and hail. Hail was limited in size due the high freezing level. The late afternoon freezing level was around 15,800 feet. Nickel to quarter size hail fell during the early stages of the event in Emmet and Palo Alto Counties. As the system moved southeast the main mode of severe weather became high winds. The town of Armstrong, in Emmet County, was hard hit by high winds which caused widespread power outages in the city. The storms weakened rapidly as the progressed southeast. Initially, the storms were in a fairly favorable shear environment, but as they move southeast the moved out of the favorable environment into a weakly sheared environment over central and southern Iowa

Story County

Nevada **19** **1745CST** **0** **0** **5K** **2K** **Thunderstorm Wind (EG57)**

Tama County

2 S Garwin **19** **1853CST** **0.2** **30** **0** **0** **1K** **Tornado (F0)**

Tornado touched down briefly in farm fields south of Garwin.

A complex weather situation set up over Iowa during the afternoon of the 19th. During the previous day, a strong short wave moved across Minnesota into Wisconsin. A trailing frontal boundary swept across Iowa and set up an east to west boundary across northern Missouri into Kansas. This boundary resulted in an area of thunderstorms during the night of the 18th into the morning of the 19th. These storms reinforced the boundary. During the afternoon of the 19th, the boundary set of another line of thunderstorms in the same area. In the meantime, another cold frontal boundary moved into northwest Iowa from the northwest during the afternoon and evening of the 19th. The airmass ahead of the boundary became unstable with surface temperatures warming into the upper 80s to low 90s and dew point readings in the low to mid 70s. Moisture streamed north into the are as a tropical tap was clearly evident on satellite pictures extending into Iowa. Precipitable water values reached 1.5 to 2 inches across the area. By evening, lifted indices

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IOWA, Central

were in the -5 to -8 C. range with cape values in the 1500 to 3000 J/kg range. In spite of the unstable airmass, hail as limited with freezing levels between 15,000 and 15,800 feet. The storms that developed along the old frontal boudary to the south of Iowa effectively cut off much of the severe weather potential across the CWA. Some storms did form ahead of the cold front. They produced 40 to 50 MPH winds and small hail for the most part. The interesting feature of the air mass over Iowa was the fact that Iowa was in an island of dry air aloft during the day with 850 mb dew points in the zero to +5 C. range. This aided in the development of numerous non-severe downburst wind events. During the evening, a strong moisture gradient lifted north into the state. The moisture gradient created a boundary and helped produce the conditions for one of the thunderstorms to produce a brief tornado touchdown in Tama County. The tornado touched down in open country and caused little damage. Storms earlier in Story County produced downburst winds that downed power poles in Story County at Nevada and damaged branches in the town of Gilbert.

Wayne County								
3 S Allerton	**28**	**0330CST**	**0**	**0**	**1K**	**5K**	**Hail(0.88)**	

A cold front dropped southeast across the state during the day on the 27th and stalled out over southern Iowa during the evening of the 27th in to the morning of the 28th as the upper air pattern became blocked by the approach of Hurricane Katrina. During the early morning hours a short wave dropped southeast into the area and helped ignite an area of thunderstorms over southern Iowa. The freezing level was quite high at 14,800 feet. The airmass was quite unstable with surface dew points around 70. Lifted indices were around -8 C. with 2000 to 3000 J/kg of CAPE. Most of the storms produced very heavy rainfall and some small hail. One storm over Wayne County became severe. WSR-88D showed a very strong core with 65 dbz raching 19,500 feet AGL and the 50 dbz core reaching 39,000 feet AGL. The storm produced nickel size hail south of Allerton.

Decatur County								
3 W Lamoni	**28**	**1835CST**	**0**	**0**		**5K**	**Hail(0.75)**	

The cold front mentioned in the previous event earlier in the day made little progress south during the day and was only as far south as northern Missouri by the evening of the 28th. The airmass remained fairly unstable, but not as unstable as it was during the early morning. Dew points were in the mid to upper 60s with lifted indices in the -2 C. range. Surface based CAPE values were minimul, in the 100 to 200 J/kg range with 500 J/kg of inhabition. Elevated CAPE values were around 800 at the 730 mb level however. In spite of the limited instability, penny size hail was reported west of Lamoni as thunderstorms fired north of the front. The freezing level had dropped during the day and was down to 12,800 feet by the evening hours.

Marion County								
Pleasantville	**31**	**1633CST**	**0**	**0**	**5K**	**5K**	**Hail(1.00)**	
Marion County								
Knoxville Arpt	**31**	**1705CST**	**0**	**0**	**1K**	**1K**	**Thunderstorm Wind (MG54)**	
Marion County								
4 NW Marysville	**31**	**1740CST**	**0**	**0**		**5K**	**Hail(0.75)**	
Monroe County								
4 WSW Albia Muni Arp	**31**	**1824CST**	**0**	**0**		**5K**	**Hail(0.75)**	
Monroe County								
3 WSW Albia Muni Arp	**31**	**1835CST**	**0**	**0**		**5K**	**Hail(0.75)**	

A cold front dropped southeast across the state during the afternoon and evening hours. The dymamics were fairly week with the surface low located between Brandon and Dauphin, Manitoba. Shear values were only around 20 m/s. The freezing level was quite high at 14,800 feet. CAPE values were not all that high and were in the 1000 to 2000 J/kg range, however lifted indices were in the -6 to -7 C. range. CAPE in the hail formation level of the atmosphere was around 300 J/kg. A lone thunderstorm formed southeast of Des Moines during the late afternoon. The storm continued to move east-southeast with new storms forming on the southwest frank of the existing storm. The storms were quite smal and produced a large amount of pea to marble size hail. Each time one would form, it would produce three quarter to one inch diameter hail for a brief period. There was one report of high winds with the storms as a 62 MPH wind gust was measured at the Knoxville Airport.